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Small scale dairy processors in the lake zone region of Tanzania

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EXECUTIVE SUMMARY

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INTRODUCTION

Previous work has been done by SNV to identify the key players in the dairy value chain in Tanzania. Their findings show that there are two market subgroups in the Tanzania dairy value chain. The first is the formal market, which is characterized by processors who must meet quality control standards and government regulations. The second is the informal market, which is characterized by the sale of unprocessed raw milk to the consumer. Outside of the market subgroups, a significant portion of Tanzanian dairy consumption occurs in the form of unprocessed raw milk on farms.

At the base level of both market subgroups, there are producers who raise and milk the cattle. In the formal market, the milk is then transported to collection centers, either by the producers themselves or by middlemen who may collect from several producers. Collection centers act as a gathering point for multiple producers in an area. Collection centers then transfer the milk to processors. Processors pasteurize the milk and produce various milk products. These products are distributed to the consumer market, either by the processors themselves, or through retailers. The retailers may source the products from wholesalers or the processors depending on the distribution strategies.

The informal market follows a shorter supply chain. The raw milk is sold directly to the consumer by the farmer, or by middlemen. Because the informal market is not constrained by quality control or government regulations and because the supply chain is much shorter the consumer price is much lower. Additionally, producers are generally able to secure a better price for their raw milk through this market. The informal market is technically illegal, however, it makes up over 90 percent of the on market dairy consumption.

Each stage of the dairy value chain faces its own challenges. In terms of processors, previous work by SNV has to a large extent focused on larger processors. The challenges identified by these processors included, technical and setup challenges, aligning production capacity with installed capacity, packaging costs, quality of milk, seasonality of milk, liquidity and capital challenges, competition with high quality imports and informal markets, and low consumer consumption.

Despite the challenges noted by large-scale dairy processors several small-scale dairy processors (SSDPs) have also entered the market place. These processors may or may not share the same challenges. In addition, small enterprises are generally run by few individuals who must fill multiple roles within the operation. Whereas, large enterprise

may staff individuals to focus on single tasks of expertise, such as marketing or accounting, small enterprises do not have these luxuries. Due to their small size SSDPs are likely to face other challenges as well, such as maintain suppliers or the inability to purchasing in bulk. To date this information has not been assessed.

Characterization of Small-Scale Dairy Processors

There are a few different measurements used to determine the size of a company. Often the size of a business is determined by the number of employees, or capital investment, or by sales turnover.

The Small and Medium Enterprise Development Policy produced by the Tanzanian Ministry of Industry and Trade defines *micro* enterprises as those with up to 4 people employed and up to 5,000,000 Tsh invested capital. *Small* enterprises employ between 5 and 49 employees and with a capital investment of between 5,000,000 Tsh and 200,000,000 Tsh. In case both of these parameters do not agree capital investment is used as the determining factor (Tanzanian Ministry of Industry and Trade, 2002).

The Tanzanian Food and Drug Authority (TFDA, 2004) determines industry size based on annual turnover. Under these criteria micro manufacturers relates to businesses with less than 10,000,000 Tsh/year turnover, small manufacturers have between 10,000,000 – 50,000,000 Tsh/year turnover, and medium manufacturers have between 50,000,000 – 100,000,000 Tsh/year turnover (TFDA, 2004).

In the FAO document analyzing dairy sector in Tanzania, they identify *micro* dairy processors as those producing less than 500 L/day and *small* processors as those producing less than 5000 L/day (Kurwijila & Boki, 2003).

RESEARCH PURPOSE

This study aims to develop a broad overview of the SSDPs in the Lake Zone region. Specific emphasis has been directed towards identifying challenges faced by these processors, and support they themselves feel would be useful. The final product will assess the viability of the industry, identify where gaps in knowledge exist and include recommendations on how these processors can be effectively supported.

METHODOLOGY

Site visits and interviews with management of SSDPs were used to collect information. Five processors were interviewed in total. Three processors were located in the Mara region (Baraki Sisters' Farm, Nyuki Dairy, Victoria Milk), and two were located in the Mwanza region (Maziwa Lishe, Tukwamuane). These processors were selected based on previously established communication channels with SNV and their relative small levels of production.

The interviews took place during June and July of 2010 and were conducted with the aid of translators. The questions were designed to focus on gathering as much information about sourcing from producers, processing, delivery to customers, business strategies, financials, and self described areas of support. A set list of questions was developed, however, the natural discussion was allowed to move forward and additional information was gathered as it was presented.

The collected information has been synthesized to give a broad overview of SSDPs in the region without identifying the specific SSDPs. From this collection of information broad trends used to identify gaps were effective support can be targeted.

RESULTS & DISCUSSION

Overview of SSPDs Visited

The SSPDs visited have been in business for varied amounts of time. The longest time of operation was 8 years. The shortest period of operation was 10 months. The average time of operation for the SSDPs visited was just over 3.5 years. Due to the relatively short time these SSDPs have been in business, it would be difficult to make a general assessment of the long term sustainability or resilience of SSDPs.

On average the processors employed 9.4 employees. Not all of these employees necessarily worked on processing activities. Some processors employed staff for distribution purposes to greater or lesser extents. The smallest staff of any SSDP visited was 5 individuals, the largest staff was 16 individuals. Only one of the processors visited added temporary staff during times of higher production, the others maintained consistent staffing levels throughout the year.

Capital investment ranged from 4,000,000 Tsh to 40,000,000 Tsh. Although this is a 10-fold range of investment, much of the difference seemed to be attributed to whether the building

processing takes place inis owned or rented. Another major capital cost was the ownership of vehicles. Only one processor acquired the startup capital through a bank loan. The others 4 processors paid for startup cost through savings or were given funding through outside institutions without the need for repayment.

Two of the processors did not know what the capital invest in the business was. One of these processors is run as an NGO in partnership with an outside organization which provided financial support to begin operations. The other processor is part of a religious organization, which supported the construction of the facilities. This processor was transferred operational management of the dairy processing and affiliated dairy production operations when previous management left.

The SSDPs all had greater capacity to process dairy than they were actually processing. Only one of the SSDPs visited was processing more than 500 L/day. Two processors were processing less than 100 L/day. The processor with a highest production rate, was processing 700-1000 L/day. From those processors who could estimate their potential processing capacity, realized rates of production were between 30-50% of installed capacity. This is higher than the rate that has been found in large dairy processors. Three of the processors were producing sour milk and fresh milk, one processor was only producing sour milk, and another was producing probiotic yogurt and fresh milk.

Three of the processors had some history of working with dairy. One owner had preciously been involved in another processing company, the owners of another had run a milk stand, while the staff from the third SSDP was transferred from previous management and had received training. The other two processors had no experience in the dairy field. One organization was supported with training from an affiliated outside organization, while the other learned through trial and error.

Depending on which measure of business size is used the operations could be considered *micro* or *small*. Under the FAO parameters 4 of the operations qualify as *micro*, whereas, under the Tanzanian SME policy only 1 would be considered micro and the rest would be considered *small*. Despite these discrepancies in classification, it seemed from the interviews that these operations shared numerous commonalities and represented an appropriate cohort for studying small-scale dairy processors.

Milk Supply

Most of the SSDPs were sourcing milk from middlemen who collected milk from multiple producers. Sourcing from producers directly did not occur except in one case where the producer delivered a few L per day, and this only occurred because of odd circumstances. Most of the SSDPs did not appear to have knowledge of the milk producers who's milk they were being delivered

Two of the processors were involved in producing their own milk. One had a fairly large operation that substantially contributed to their milk supply. This was one of the processors who did not pay for the upfront costs. It is difficult to determine if this system would be financially beneficial if the entire costs were incurred by the business. The other sourcing their own milk, owned two cows. At the current rate of production (2-4 L/day) this was not financially beneficial. Given their costs to support the cows, they would need to receive 7 L/day for the operation to be profitable. The costs to purchase the cows and land were paid through a grant. Another processor mentioned that they had previously owned cows but no longer did. The details of this change were not made clear. Based on these findings it does not seem common for SSDPs to process their own milk without some outside funding supporting start up costs.

In most cases the SSDPs had built relationship with certain suppliers who would regularly bring in raw milk. None of the SSDPs had formal written agreements, rather verbal agreements were considered to be sufficient. The cost per L varied from 300-400Tsh/L in the wet season to 450-500 Tsh/L in the dry season. One SSDP paid a higher rate of between 600-700 Tsh/L, but their prices did not fluctuate seasonally. This processor was located in Mwanza city. They had been in contact with several milk suppliers and found this range of pricing to be the norm. There seems to be a rather large discrepancy in the market price of milk between rural areas and the city, which could reflect high collection and transportation costs.

Availability of milk would vary between wet and dry season. During the dry season most of the SSDPs only received milk from those suppliers they had built strong relationships with.

During the wet season multiple other suppliers approach the processors. All the SSDPs made an effort to buy preferentially from those suppliers who were loyal in bringing supply year round. Even so sourcing enough milk during the dry season was generally stated as a challenge, especially because several processors noted an increase in demand for their products at this time.

Aside from consistently providing business with certain suppliers, regular payments were often stressed as important. Usually the payment plans were weekly or monthly as agreed upon with the suppliers.

Two of the processors had gone beyond reliable payment schedules to strengthen their relationship with their suppliers. One organized a meeting between the local livestock officer and the suppliers to improve the handling of the milk. Another has in the past provided loans for purchasing of bicycles. Recently they were attempting to organize their suppliers into a more formal group. This was being pursued to ease communication with a rather large group of suppliers. They also hoped the suppliers would then be able to invest in larger purchases that would likely be out of reach for the individual suppliers, thing like large containers of liquid soap to improve cleaning. Liquid soap, which can improve container cleaning, is sold in large quantities with relatively high costs. Purchasing these large containers of liquid soap tends to be difficult for individual milk suppliers, but as an organized group funds could be pooled to ensure hygienic cleaning. This particular processor seemed to be very interested in developing a strong relationship with suppliers. They suggested that the effort was worthwhile, as they had built several strong relationships, which attracted suppliers even when other competition offered high prices for their raw milk. Moving beyond a supplier relationship of simple payment is potentially doubly effective in improving milk supply quality and dependability. Since SSDPs are able to know their suppliers more directly this may be an area where SSDPs can out perform large scale processors.

Adulteration of Milk

Adulteration of milk by middlemen has been noted as an issue in the Lake Zone dairy value chain in the past. Previous work focused on large processors who were receiving milk from numerous suppliers. Adulteration seems to be an issue with SSDPs as well, despite having many fewer suppliers. It was generally noted that adulteration was more prevalent during the dry season when supplies for raw milk are low and the demand from customers is high. During this time the processors are likely to take milk from any sources that are offering.

In addition to intentional adulteration of the milk, several processors noted issues with contaminated or spoiled milk. Either due to improper handling or from improper cleaning of containers. These issues are often related to the use of plastic containers which cannot easily be cleaned. Many suppliers use plastic containers because they are cheap and they are easily fit onto bicycles to allow for the transport of large quantities of milk. However, the design of the containers has many small crevices and a small opening, which makes cleaning especially difficult.

The processors seemed to be well aware of the dangers posed from altered or contaminated milk. Three of the processors were using both a lactometer and ethanol to test the density and purity of the milk. The other two processors only tested for the density of the milk using a lactometer. One processor had been testing using a lactometer did not have a lactometer at the time of the interview because it had broken. This is especially concerning given that the interview took place during the dry season when adulteration is more prevalent. This processor had recently had issues with contaminated milk resulting in losses of 100L of product.

When presented with raw milk of diminished quality, SSDPs would either not purchase the milk or return the milk to the supplier. Often processors claimed to confront suppliers with poor records for quality, which seemed to be effective for controlling the problems. It did not see that the SSDPs regularly ended supplier relationships due to adulteration, at least not after single instances.

Dairy Processing

As mentioned earlier, the SSDPs all had greater capacity to process dairy than they were actually processing. Only one of the processors visited was processing more than 500 L/day during the dry season. Two processors were processing less than 100 L/day. The processor with a higher production rate, was processing 700-1000 L/day. From those

processors who could estimate their potential processing capacity, realized rates of production were between 30-50% of installed capacity. Three of the processors were producing sour milk and fresh milk, one processor was only producing sour milk, and another was producing probiotic yogurt and fresh milk.

Most processors saw some variability in their rates of production throughout the year. This was attributed to the seasonal availability of milk and changes in customer demand. The largest variability was stated as being 400 L/day in the dry season and 1000 L/day in the wet season. While most of processors increased their production during the wet season when milk is more readily available and prices are lower, one processor indicated that they increased production in the dry season. This processor preferred to pay higher prices for raw milk because the demand from consumers was higher. The price to the customers was maintained across the seasons.

Most of the processors used wood heated water baths to pasteurize the milk, and water tanks to cool the milk after pasteurization. One processor used gas and charcoal to directly heat the milk, while manually stirring the contents, and then cooled using a water bath. This processor was producing less than 100 L/day.

Certification

Certification for dairy products falls under the jurisdiction of Tanzanian Bureau of Standards (TBS) and the TFDA. TBS maintains standards for milk pasteurization, whereas, the TFDA certifies prepackaged food products including dairy.

According to TBS standards milk should be pasteurized in one of two ways (TBS, 1985). Using *the holding method*, milk is heat to between 62°C and 66°C and held at this temperature for 30 minutes. Then rapidly cooled to 4°C or less and kept sealed at this temperature until the contents leave the premises. The other method is called *the high temperature short time method*. Using this method the milk is heated to above 72°C and maintained at this temperature for at least 15 seconds. After heating the milk is rapidly cooled to 4°C or less and maintained at this temperature in a seal container until it leaves the premises (TBS, 1985).

An examination of the processors' pasteurizing techniques was not included in this study. It seems likely that some of the processors were not able to follow these standards exactly. This may be an area of future work to see how closely SSDPs are able to match the dairy pasteurizing standards. Many of the SSDPs visited sold sour milk and at least one

mentioned this was because it was better able to keep without refrigeration. This would suggest that at least some processors are not meeting the requirements of keep the product below 4°C until leaving the production facility. Many of the processors were also selling fresh milk to customers who would bring in their own containers. This could disqualify the processors from meeting the standard of keeping the products protected from contamination.

The TFDA regulates that all prepackaged food must be registered before entering the Tanzanian market. Under the TFDA mandate prepackaged foods must have a facility inspection as well as a product inspection. The cost for these inspections depends on the size of the operation. The pre-operation inspection fees are 100, 50 or 20 US$ for medium, small and micro industries respectively (based on the TFDA measurement of industry size) (TFDA, 2004). In addition to the regular registration process, registration of dairy products must include a HACCP plan (Hazards Analysis and Critical Control Points) and certification of compliance. Developing a HACCP plan involves 12 tasks and regular monitoring (FAO, 2003). Based on the complexity of an HACCP plan it is unlikely that many small or micro processors would have the capability to meet this requirement. [contact TFDA to see if this applies to SSDPs or if there are some other regulations] [Contact SIDO to see what they do to help gain certification and what their mandate is in this respect]

All the SSDPs visited seemed to have an understanding of the need for certification with one or both the TFDA and TBS. Only one processor had TBS certification. Three of the processors had some contact with the TFDA. Most of the recommendations from the TFDA related to packaging and labeling of the product. One processor also had the product inspected by the TFDA.

One of the processors without TBS or TFDA certification was directed to the health officer. After reviewing the requirements for certification they realized they were not compliant. Since then they have been working to be the standards and are planning to contact the health officer when this is done. Another processors with neither TBS or TFDA certification, has contacted the Small Industry Development Organization (SIDO), who inspected the site and are in the process of helping the SSDP to gain proper certifications.

Based on the interviews it seemed that the SSDPs were eager to gain the TBS certification. When certification is attained a symbol can be placed on the product packaging, and many of the SSDPs felt that this would improve sales and open up new markets in shops. However, based on the low rates of certification it does not appear that the SSDPs feel obligated to receive these certifications in order to operate.

Packaging

Four of the five processors interviewed use ¼ L manually heated sealed plastic bags to package their products. One processor also used ½ L plastic bags. The only processor not using plastic bags is processing probiotic yogurt and had found that the heat seal plastic bags were not of sufficient quality for the product. They have since begun packaging their product in ½ L plastic cups with heated sealed aluminum lids. Only one of the processors selling fresh pasteurized milk packed this product. Fresh milk was usually purchased by customers coming directly to processing facility or sold in bulk containers as standard orders.

Only one of the processors using the plastic bag packaging was satisfied with the performance of the packaging. The other felt that the poor quality of the product limited their ability to transport the product over large distances, since the packages would break or leak in route. The lack of a cost effective alternative was generally stated as the reason for continuing to use the plastic bags. By comparison these plastic bags can be purchased for as little as 18 Tsh, whereas the plastic cups used cost roughly 100 Tsh per unit. As a result plastic bags remain the preferred form of packaging.

Although many forms of packaging are available few meet the needs of small processors. Many packaging systems require large investments into equipment and bulk orders of packaging, which is beyond the scope for SSDPs. Since they are limited to packaging systems with small machinery and investment the options available seem to be quite limited.

Despite being widely used in Tanzania plastic bags are technically illegal. A law banning all plastic bags was passed in 2006. Details of the exact law were difficult to find, and to date the law has not been enforced. Several of the processors mentioned concern over the situation and admitted they had made no plans to adjust if the law were to be enforced.

Two of the processors claimed to have been told that their packaging met the government regulations. Clearly the current situation causes some challenges due to the lack of enforcement and clarity of the current regulations. This has been identified by TAMPA who are lobbying the government to improve the law in a way that will address dairy processors' concerns.

Distribution

The SSDPs visited presented a variety of distribution methods. Some sold directly from their processing facilities, others made use of depots in urban centers. All of the SSDPs concentrated most of their sales in the nearest city or town. This is somewhat expected as the volume of production is quite low. All but one of the processors had expanded markets beyond one town or city. The processor who had not expanded is located in Mwanza, which provides a rather large market in itself. All the estimates by the processors suggested roughly 80% of sale are concentrated in a single market area.

Of the processors in the Mara Region, two have expanded to sell in the Mwanza market. The third SSDP in Mara had previously sold to Mwanza but had stopped because transportation and communication became difficult. Those delivering to Mwanza use public transport to deliver their product. One of the processors acknowledged high losses from this trip. This was linked to the poor quality of the packaging. The SSDP located in the Mwanza Region but outside of the city, used public transport to distribute products to another town an hour or so away. This processor did not find high losses from the transportation, but had to scale back distribution due to difficulties in arranging transportation and communication between the multiple villages. Aside from losses due to packaging failure, another concerns associated with the use of public transport, which was not mentioned by any of the processors, is the lack of cold chain distribution. This could pose quality concerns due to spoilage, which could pose health risks to consumers.

Two of the processors made use of depots in urban centers where product could be collected and stored. One of these processors had two depot locations. The other had three depot locations all located in different towns. One of the processors, used their depots only as a distribution point, the other used their deports as sales sites as well as a distribution points.

Of the distributers using public transportation to enter new markets only one of these processors were responsible for collecting and selling the product in the other city. This processor maintained a depot in the other location. The other two SSDPs using public

transport sold directly to a distributer on the other end who collected and sold the milk. Under this arrangement the transport costs were the responsibility of the distributer.

The fourth processor selling in multiple markets had private transport, which was used for distribution. They reported few losses in travel.

Two of the processors distributed their products by bicycle vendors direct from their processing facilities. The bicycle vendors would sell the packaged milk to shops within the immediate area. In one instance the bicycle vendors received commission per package sold. In the other, the bicycle vendor received a monthly salary.

Pricing

The ¼ L plastic bags of milk were sold by processors to stores for between 200-250 Tsh. The shops would then sell the bags for between 250-400 Tsh. Two of the processors selling for 200 Tsh also paid commission to the bicycle vendors selling to the shops. As a result their unit revenue was 170 Tsh. Only one of the processors changed their selling price based on the cost of raw milk. The others we willing to accepted smaller margins over short periods to maintain customer support.

The processor producing probiotic yogurt sold packaged ½ L contains for 650 Tsh. Unpackaged yogurt is selling for 500 Tsh/L. The Fresh milk sold in bulk was sold for between 500-800 Tsh/L and was unpacked in all but one instance. When packaged, fresh milk is sold for an equal price to sour milk.

At these prices the SSDPs are able to sell their products at lower costs than the large processors. [prices for milk, yogurt in shops – rough prices from hawkers]. This

Business Training

The level of business training and experience varied between the SSDPs. Some of the processors have had experience running other businesses, while others were taking business management roles for the first time. The level of training before starting the dairy processing operations also varied. One processor had had no business training, while the other four had received business training of some sort. One processor had been trained by out going staff, but had not had any formal training. The other three had received business training of varying lengths and depths covering bookkeeping and business management.

All but one of the SSDPs visited mentioned that access to more business training would be beneficial. The main areas of training that were identified were bookkeeping and general business training. Many of the processors were also eager to receive training in additional dairy processing techniques. Many of the SSDPs were hoping to gain knowledge in cheese making, and seemed to identify diversifying their products as a means of increasing revenue and avoiding mass spoilage events.

Financial

Based on the interviews it seems that SSDPs are financially viable. This should be accepted with some caution as only one processor made their books available. For the other processors financial figures were roughly given verbally. Based on the costs and sales that were quoted it would seem that the processors were generally fairing quite well. However, there was one processor who based on the figures provided was likely running at a loss. Key factors seem to be monitoring operational costs, securing fair prices for raw milk so as to compete with the large processors on price, and reducing expenditures on things like running generators.

Upon examining the books of the one process, there had been several recent months where the business was running at a loss. This was one of the smaller processors who were not actively seeking sales. Recently pursuing sales has become a larger focus of the processor and they have been able to turn a reasonable profit, but seem to continue to have trouble sustaining focus on sales and not simply focusing on levels of production. This was also one of the processors who had received support with start up costs and therefore did not have to pay down initial investments.

Without access to financial records it was difficult to determine how the processors were fairing with seasonal variations in raw milk and sales. This may be an area where future examination is worthy, as effective strategies for the processor to manage these fluctuations in the price of raw milk and production volume would be beneficial.

The interview also aimed to determine the sophistication of the processors financial knowledge. One processor was not actively keeping financial records, although they were keeping production records. During the interview the owner seemed to have a fairly detailed knowledge of the companies expenses but this was never recorded or calculate with respect to revenue to determine profitability. This was the same processor who had not received business training prior to opening the business, and the processor who was likely running at a loss. This shows the dangers that can develop when entrepreneurs enter a business without proper training. It is likely that this processor is not unique and that at

least some portion of small dairy processors enter the field without appropriate business training.

The other processors visited kept financial records of expenses and revenue, and would tally monthly breakdowns. As a marker of financial sophistication processors were asked if they had calculated their breakeven point for sales. At least three of the processors were not familiar with developing a breakeven point. The other two processors had developed rough estimates of breakeven points. But these did not seem to include variation for different levels of purchase and production.

Financial record keeping and accounting seems to be an area where SSDPs are likely to benefit from training support.

All the SSDPs mentioned the want to secure loans. Although, none of the SSDPs visited was able to secure these funds through regular banks. Two of the SSDPs did not have tax identification numbers, which disqualifies them from bank loans. Another could not apply for a bank loan because they were organized under a church constitution, which is not recognized by the banks. Another had received a loan for startup costs from a bank by leveraging their house and were able to pay off the loan in a single year at 10% interest. However, they were not able to leverage their house for the amount they were seeking for a new loan. One of the SSDPs was in the process of having a loan application processed, however, this was not through traditional bank and the loan had the low interest rate of 2% [is this per month????] [which bank] [any progress].

One processor was able to find a loan with the low interest rate of 2%. Although, the paperwork had been in processing for sometime and the money still has not been made available. The delays are potentially a sign of large number of applicants. While this is a great opportunity for this particular processor it is unlikely these loans will be available to most SSDPs and therefore does not represent an ideal solution for the sector in general. But

it is a good sign that some institutions are targeting small enterprises with loan opportunities.

From further questioning on the details of money and loans sought after, it appeared that the different processor had varying levels of understanding on the details of the loans they would need. Most seemed to have an idea of the need for capital to improve equipment or for expansion, but had not gone into detailed planning on how much they could invest and reasonably expect to payback.

As an example of the banking loan process, the National Microfinance Bank (NMB) offers loans of the relative size that many of these businesses were seeking, which are marketed directly to micro and small enterprises. However from a brief examination of the banks requirements, not all of the SSDPs would qualify for the loans. NMB requires 12 months or more of experience in the business field, that the recipients have a register business, have proper books in order, and have and account with NMB. While all of these requirements are reasonable it shows the obstacles that SSDPs must address before they are able to secure loans through banks.

Marketing

The most sophisticated marketing described by the SSDPs was the use of local radio broadcasts and the use of speaker car advertising. It did not seem that the result of this advertising had been studied.

Most of the processors indicated that they relied on word of mouth and product quality for marketing. Another tactic was to approaching shop owners directly to see if they would stock their products was also used.

The processors sited their want to increase advertising but did not have the financial means to invest in advertising at this time. It seemed that most processors had aspirations for large marketing campaigns involving radio broadcasts or magazines. The processors did not seem to think of less costly forms of advertising such as posters in shops or more active branding of their products. Training in simple cost effective marketing is another area where SSDPs would likely benefit from support.

Future Planning

Future planning was another area of examination during the interviews. Most of the SSDPs future planning revolved around either expanding to new markets or diversifying products sold. Several processors mention the want to enter or increase sales in the large market of

Mwanza. Two of the processors mentiond the idea of entering Dudoma or Dar es Salaam. When discussing these plans the challenges of long distance transport and cold chain distribution were not included. Without having received the complete details of their planning for this kind of expansion it would seem to be out of reach for any of the processors visited to create the cold chain necessary for expanding to distant markets. However, it was poor packaging and finding local retailers that were mentioned as major challenges to these plans.

Others seemed to be more realistic about their plans to expand. One processor was looking into heiring other employees specifically for expanding their area of sales. One processor mentioned the using money for loans to purchase a private vehicle to make the trip to surrounding villages, where they felt there was a market for the product, but public transport had not been effective in the past. Investing in a pikipiki or another light vehicle could be an effect way of dealing with these challenges, but should perhaps be weighed against alternatives such as hiring similar transportation as needed.

Another common future plan mentioned was the diversification of products. Several SSDPs identified the tourist market especially in and around the Serengeti National park as a good opportunity to sell products such as cheese, yogurt, and butter. The processors also recognized that diversifying would help to reduce risk of spoilage and could improve returns. Two of the processors had purchased cream separators in an attempt to include butter and ghee in their products. However, both of the machines had broken and were not repairable locally. Finding a means to maintain this type of equipment should be a priority before expanding investment into new equipment. The processors also seemed to recognize that they would require technical training to expand production into items like cheese.

A few of the processors were interested in purchasing more storage equipment so that they could increase their volume of production. Another processor was examining the potential to connect to the electrical grid as running generators represented a considerable expense.

GAP ANALYSIS & CHALLENGES

The Gaps identified herein are not necessarily shared by all of the SSDPs interviewed, but did seem to be present for some. It is likely that similar Gaps in knowledge occur in other SSDPs, which were not interviewed. Therefore, even Gaps present in a single processor in this study could be shared by many processors throughout Tanzania.

1. Seasonal variation in the availability of milk presents business challenges for SSDPs. This causes price fluctuations, restricts access to supply, and also seems to be associated with increased risk of adulteration. It is unclear whether SSDPs have an effective strategy to deal with these challenges.
2. Testing for adulteration needs to be promoted to all SSDPs. This should include testing with lactometers for density, and ethanol for impurities.
3. There appears to be potential to develop stronger relationships with suppliers and milk producers because of their small size SSDPs may be able to build strong bonds with individual suppliers.
4. Diversifying production into other products would require more sophisticated training and this was an acknowledge gap in knowledge for many processors to meet their goal.
5. Proper bookkeeping and accounting skills were lacking in some but not all the processors.
6. There seemed to be a knowledge gap in low cost marketing and branding options and how to use these tactics effectively.
7. Access to loans is often a stated goal of many SSDPs. However, it is unclear whether the requirements and challenges of loan repayment are always well understood.
8. Knowledge of alternatives to loans for gaining capital seems to be lacking. There may be other source of short term capital that are more accessible and better suited depending on the specific needs of SSDPs.
9. SSDPs seem to be particularly affected by the current plastic bag regulations in Tanzania. The unclear nature of the implimentation of these regulation put the processors in a difficult position, which discourages their changing packaging because of increased costs but also makes them unsure of how to proceed.
10. There also seems to be a Gap in servicing SSDPs with a comparatively alternative to single plastic bags.
11. TFDA and TBS certification does not seem to be viewed as a mandatory requirement by many SSDPs. The exact regulations as they apply to SSDPs also seems to be lacking.
12. Not all the SSDPs have the skills needed to create realistic short term and long term business plan and the skills to develop a strategy for reaching those goals.
13. The long term sustainability and resilience of SSDPs is also unknown because of the relative short periods of operation of those SSDPs interviewed.

STRATEGIES OF SUPPORT

Issue	Time frame	Support Strategy
Milk Supply	Short Term	• Link processors with livestock officers to provide information on testing quality of milk using lactometers ethanol and other methods
	Medium Term	• Analyze the business challenges associated with seasonal changes in availability and price of raw milk • Organize meetings between SSDPs and suppliers to build relationships and to examine potential for SSDPs to act as hub for supplier
	Long Term	• Develop strategies for passing findings to SSDPs and effective means of implementation
Milk Processing	Short Term	• Examine costs and challenges of processing other forms of dairy products, and feasible for production by SSDPs
	Medium Term	• Examine markets for dairy products • Link SSDPs with training in processing of other products
	Long Term	• Connect SSDPs with contacts who can service equipment or training on how to service dairy processing equipment
Packaging	Short Term	• Provide SSDPs with available information on the current regulations surrounding plastic bag packaging • Support TAMPA in lobbying the government on this issue
	Medium Term	• Research small scale packaging systems, which are compliant with current laws
	Long Term	• Link SSDPs with producers of alternative packaging systems suitable for their needs

Issue	Time frame	Support Strategy
Certification	Short Term	• Provide SSDPs with information on TBS and TFDA regulations and need to comply with these regulations • Link with organizations like SIDO who can help SSDPs in attaining certifications
Financials and Business Planning	Short Term	• Inform SSDPs of some general requirements for receiving funding through banks, such as, registering the business and keeping proper business records
	Medium Term	• Link SSDPs with business training providers who can address issues associated with small enterprise management, bookkeeping, marketing, and business planning • Develop a learning opportunity for the SSDPs to come together to share experiences

CONCLUSIONS

It is clear based on this research that the SSDPs in the Lake Zone region share some commonalities. However, it is also apparent that these relatively similar businesses have developed a wide variety of business strategies. This is likely a result of differing levels of business training and sophistication.

SSDPs seem to be servicing a market of customers who would like to consume pasteurized milk of quality, but do not want to pay the high price of UHT milk. As a result SSDPS must monitor their quality to ensure that it is above that of the milk hawkers in the informal market, who sell for a lower price, and they must maintain a low enough price to compete with large processors, who produce a longer lasting product at a higher price. Adding to these challenges the cost and availability of raw milk fluctuates throughout the year. Not only does this change the profit margins throughout the seasons, it also complicated the ability to compete with hawkers and large processors. During the wet season hawkers are able to sell their product at a reduced rate because raw milk is easily available and they have few other costs to consider, and during the dry season SSDPs must compete with large processors who are willing to purchase milk from producers at much higher price to

maintain the processing volume. Large processors are also able to persue different strategies to weather the dry season, such as purchasing powdered milk or investing in UHT, which last longer and can produced in the wet season for upcoming dry seasons. These options are not available to SSDPs because of the large costs involved.

Based on the information gathered in this study it appears that SSDPs are able to be financially viable despite their small size, active competition and the other challenges they face. However, success is not guaranteed. Some SSDPs lack proper business training or have little experience in the dairy field. Linking SSDPs with business training and providing an accurate picture of the many challenges SSDPs must face to maintain financial viability should be the main support directed their way

Other challenges identified in this study include monitoring raw milk quality, lack of quality affordable packaging, lack of certification, and difficulties securing loans. Many of these challenges are reminiscent of those identified for large dairy processors. However, it should be noted that because of their small size SSDPs have few staff available to address these issues and it is likely that those individuals will not have the necessary expertise to find the most appropriate solutions.

While SSDPs face quite a few difficulties the small size of SSDP operations may provide them with some advantages over larger processors. One advantage in maintaining a small size is that the processor seem to be able to maintain a profitable business while mainly focusing on a single town or city market. Due to their large distribution areas and milk sourcing, large processor require large investments in cold chain distribution. By maintaining a smaller distribution area SSDPs maybe be able to avoid these additional expenses and this should enhance their ability to compete with large processors.

Additionally, several independent milk suppliers generally service SSDPs, whereas large processors' milk supplies come from a much larger number of suppliers or they are serviced by multiple collection centers. Because of this SSDPs are in a better situation to know their suppliers on a more personal level and can build strong relationships of trust. Based on the reached in this study it seems that some SSDPs are actively trying to build stronger relationships with their suppliers by organizing learning opportunities and encouraging suppliers to organize themselves. Its possible that these types of activities, which are mutually beneficial for both suppliers and processers, could help to regulate the difficulties in season milk supply fluctuations by creating stronger relationships which are not solely based regular payment.

One major gap in the current study is the lack of SSDPs who have longevity. The oldest operation in this study has only been processing dairy for eight years. As a result it is difficult to hypothesize about the potential long-term sustainability and resilience of SSDPs. Another factor to note in this study is that two of the five processors received outside funding to start operations, and this may not be indicative of SSDPs in general.